

REMARKS

Claims 1-36 are now pending in the present application. Claims 1, 2 and 17 have been amended and claims 22-36 have been added. Claims 1, 2, 17, 27 and 32 are independent. Reconsideration of this application, as amended, is respectfully requested.

Information Disclosure Statement

An Information Disclosure Statement was submitted to the U.S. Patent and Trademark Office on March 29, 2004. **It is respectfully requested that the Examiner initial the PTO-1449 Form attached thereto and forward a copy with the next Office Communication in order to indicate consideration of the references listed thereon.**

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1-8 and 17-19 stand rejected under 35 U.S.C. § 102(b) as anticipated by Lorts, USPN 6,467,465. Claims 1-21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2000-97132 in view of Lorts. Claims 1-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2000-97132 in view of Ulrich, USPN 4,257,375. These rejections are respectfully traversed.

The present invention is directed to a fuel injection apparatus that can be detached from an outside of an air chamber. Therefore it is unnecessary to disassemble the air chamber to perform maintenance and inspection of the fuel injection valve.

Independent claims 1, 2 and 17 exemplify the present invention. Independent claim 1 is directed to an engine fuel injection apparatus, wherein a combination of elements are recited including a fuel injection valve "provided on a wall of said air chamber facing a wall connected to the upstream end of the air intake passage." In addition, independent claim 1 recites "wherein said fuel injection valve includes at least an ejection port thereof located inside said air chamber."

With regard to independent claim 2, this claim is directed to an engine fuel injection apparatus, wherein a combination of elements are recited including a fuel injection valve "being provided on a wall of said air chamber facing a wall connected to the upstream end of the air intake passage." In addition, independent claim 2 recites "wherein all fuel piping and wiring to and from said fuel injection valve are located outside of said air chamber."

With regard to independent claim 17, this claim is directed to a fuel injection apparatus for an engine, wherein a combination of elements are recited including a fuel injection valve "provided on a second wall of said air chamber, said second wall being located opposite to said first wall." In addition, claim 17 recites "wherein said fuel injection valve includes at least an ejection port thereof located inside said air chamber."

Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the present invention as recited in independent claims 1, 2 and 17, respectively. In view of this, the references relied on by the Examiner are unable to accomplish the advantages of the present invention.

With regard to the Examiner's reliance on the Lorts reference, the Examiner has taken the position that the Lorts reference anticipates each of the independent claims of the present invention. However, referring to FIG. 1 of Lorts, the injector valves 12 and 13 are mounted within an aluminum block 10. In view of this, the fuel injector ejection ports 33 are not located "inside said air chamber" as recited in independent claims 1 and 17 of the present invention. In addition, the aluminum block 10 includes a conduit 17 that is in communication with the ejection port of the fuel injector valves 12 and 13. Furthermore, tubing 20 is connected to the conduit 17 in order to direct the fuel toward the air intake passages. In view of this, there is fuel piping which is located inside of the air filter assembly 24. Therefore, all fuel piping and wiring to and from said fuel injection valve are not located outside of said air chamber as recited in independent claim 2 of the present invention.

In view of the above, Applicants respectfully submit that the Lorts reference fails to anticipate independent claims 1, 2 and 17 of the present invention. Accordingly, it is requested that the Examiner reconsider and withdraw the rejection under 35 U.S.C. § 102.

With regard to the Examiner's rejections under 35 U.S.C. § 103 in view of the JP '132 and the Lorts reference, Applicants respectfully submit that the Examiner's rejection is improper for the reasons mentioned above with regard to the Examiner's rejection under 35 U.S.C. § 102. Specifically, the Lorts reference fails to disclose an ejection port of the fuel injection valve being located inside the air chamber as recited in independent claims 1 and 17 of the present invention and also fails to disclose all fuel piping and wiring to and from

the fuel injection valve being located outside of the air chamber as recited in independent claim 2 of the present invention. Accordingly, the combination of the JP '132 and Lorts references fails to arrive at the presently claimed invention.

In the Examiner's Office Action, the Examiner modifies the JP '132 reference in view of the Lorts reference in order to provide a fuel injector on an outside wall of the air chamber. However, as mentioned above, the Lorts reference discloses the fuel injector valves 12 and 13 being located entirely outside of the air cleaner assembly and also discloses conduit 17 and tubing 20 in communication with the ejection port 33 of the fuel injection valves 12 and 13. In view of this, any modification of the JP '132 reference in view of the Lorts reference would be to provide the fuel injectors 12 and 13 of Lorts entirely outside of the air chamber as disclosed by the Lorts reference and to include the conduit 17 and tubing 20 also disclosed by Lorts reference. Applicants submit that there is absolutely no suggestion in the Lorts reference to modify the JP '132 reference to include the ejection port located inside the air chamber or to have all fuel piping and wiring to and from the fuel injection valve located outside of the air chamber as respectively recited in the independent claims of the present invention.

In the Examiner's Office Action, the Examiner states that it would be obvious to mount the injector of the JP '132 reference on the outside wall of the chamber as taught by Lorts "since this would have allowed for easier access to the injector during servicing." However, neither the JP '132 reference nor the Lorts reference discloses mounting the injector on the outside wall of the chamber for this reason. This reason appears only in

Applicants own disclosure. In view of this, the Examiner is engaging in impermissible hindsight. Further to this, it should be noted that the Lorts reference is directed to a fuel injector adaptor manifold. The fuel injectors 12 and 13 are added to a gasoline engine in order to convert the gasoline engine into a gaseous fuel engine. In view of this, Applicants submit that there is no suggestion in the Lorts reference to move the gasoline injector 11 of the JP '132 reference outside of the air chamber. The only teaching Lorts provides is to add additional gaseous fuel injectors 12 and 13 to an already existing engine. Referring to FIG. 1 of Lorts, it can be clearly understood that the gasoline injector 23 as well as the gaseous fuel injectors 12 and 13 are both included in the Lorts device. In view of this, one having ordinary skill in the art, considering the JP '132 and Lorts references as a whole, would not be motivated to move the gasoline fuel injector 11 to an outside of the housing, but would only be motivated to include the additional gaseous fuel injectors 12 and 13 of Lorts provided on an outside of the air chamber as disclosed by Lorts. Since the Lorts reference fails to disclose ejection ports being located within the air chamber and fails to disclose all fuel piping and wiring to and from the fuel injection valve being located outside of the air chamber, Applicants respectfully submit that the Lorts reference clearly fails to make up for the deficiencies of JP '132 reference.

With regard to the Examiner's rejection under 35 U.S.C. § 103(a) in view of the JP '132 and Ulrich references, Applicants respectfully submit that the Ulrich reference fails to make up for the deficiencies of the JP '132 reference as well. Referring to the figure of Ulrich, reference numeral 20 identifies the internal combustion engine. In the Examiner's

Office Action, the Examiner considers reference numeral 8 to be in an injector that is located outside of an air chamber. However, reference numeral 8 is not an injection valve, but is an electric starting valve as clearly understood from column 2, lines 31 and 32 of the Ulrich reference. In the Ulrich reference, reference numeral 7 is the injection valve which is clearly illustrated as being located downstream of the throttle valve and immediately adjacent to the valves of the internal combustion engine 20. Applicants submit that the air chamber of Ulrich would be located to the right of the throttle valve 12. Therefore, neither the fuel injection valve 7 nor the electric starting valve 8 are located at the air chamber and therefore the Ulrich reference fails to disclose a fuel injection valve "being provided on a wall of said air chamber facing a wall connected to the upstream end of the air intake passage" or "being provided on a second wall of said air chamber, said second wall being located opposite to said first wall" as respectively recited in the independent claims of the present invention. Accordingly, the Ulrich reference fails to make up for the deficiencies of the JP '132 reference.

With regard to dependent claims 3-16 and 18-21, Applicants respectfully submit that these claims are allowable due to their respective dependence upon independent claims 1, 2 and 17, as well as due to the additional recitations in these claims.

With specific regard to dependent claims 9-16, 20 and 21, Applicants respectfully submit that none of the references relied on by the Examiner disclose the recitations "wherein the second wall of said air chamber is provided with an electric component in the vicinity of said fuel injection valve for controlling said fuel injection valve" and "wherein an

inspection port is formed on a portion of a wall of the air chamber where said fuel injection valve is not provided, and the inspection port is covered with a removable lid” as respectively recited in these claims. Accordingly, if the Examiner believes that the references relied on disclose these aspects of the present invention, it is requested that the Examiner explain this in the next Office Communication.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1-21 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner’s rejections under 35 U.S.C. §§ 102 and 103 are respectfully requested.

Additional Claims

Additional claims 22-36 have been added for the Examiner’s consideration. Applicants respectfully submit that claims 22-26 are allowable due to their respective dependence upon allowable independent claims 1, 2 and 17, as well as due to the additional recitations in these claims.

With regard to additional independent claims 27 and 32, Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest a fuel injection apparatus, wherein a combination of elements are recited including “a second fuel injection valve disposed on said air intake passage” and “a second fuel injection valve disposed at a level lower than said first fuel injection valve” as recited in independent claims 27 and 32,

respectively. In view of this, independent claims 27 and 32, as well as dependent claims 28-31 and 33-36 should be in condition for allowance.

Favorable consideration and allowance of additional claims 22-26 are respectfully requested.

CONCLUSION

Since the remaining references cited by the Examiner have not been utilized to reject the claims, but merely to show the state-of-the-art, no further comments are deemed necessary with respect thereto.

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.


It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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